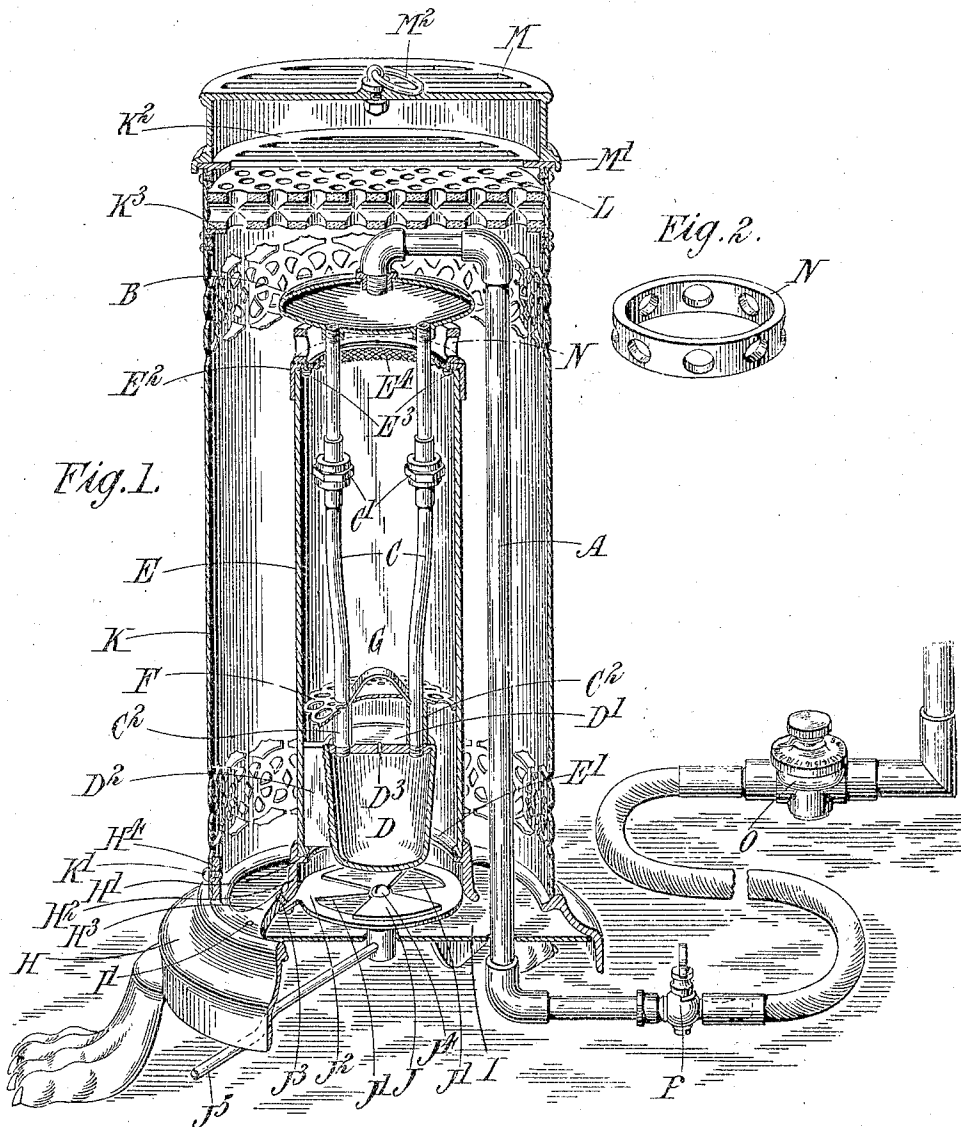


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 REGENERATIVE GAS BURNER.
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Patented Sept. 10, 1912.



Witnesses
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UNITED STATES PATENT OFFICE.

FRANZ BLUMENSTEIN, OF LONDON, ENGLAND.

REGENERATIVE GAS-BURNER.

1,038,274.

Specification of Letters Patent.

Patented Sept. 10, 1912.

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To all whom it may concern:

Be it known that I, FRANZ BLUMENSTEIN, a subject of the German Emperor, residing at London, England, have invented certain new and useful Improvements in Regenerative Gas-Burners, of which the following is a specification.

This invention relates to improvements in regenerative gas burners and has for its object to obtain the full value of the combustion of coal-gas and other combustible gases.

According to this invention the method of burning coal-gas or other combustible gas comprises heating the gas prior to its mixture with the air and utilizing the heat contained in that gas to heat conduits or chambers outside which the air supplied to the mixing chamber passes in order that the passing air may receive some of the heat from the gas within.

According to this invention, moreover, in a regenerative gas burner in which both the gas and the air are heated before being mixed, the gas is heated to a higher temperature than the air in order that the hot gas may be utilized to impart heat to the air.

The invention further consists in a regenerative gas burner for carrying out the method comprising the combination of a chamber arranged to be heated by the flame of the burning gas and through which the gas supplied passes, a second chamber connected to the first chamber and from which the heated gas issues, and a mixing chamber surrounding the second chamber and extending toward the first chamber.

In the accompanying drawings:—Figure 1 is a sectional perspective view showing the invention embodied in a gas heating stove; Fig. 2 is a perspective view of a perforated ring of refractory material hereinafter referred to.

A, indicates the gas supply pipe which is connected to the top of a circular metal chamber B of lenticular cross-section.

C, C indicate two pipes, preferably of mild steel, screwed into the underneath side of the chamber B and extending downward and screwed into the top D¹ of a second chamber D. For convenience in assembling the parts the pipes are in two parts joined together by unions C¹. The lower chamber D has a number of projecting ribs D², in the present instance there are three, which

fit easily into a mixing chamber E and rest on a projecting rib E¹ near the bottom of the mixing chamber. Segmental spaces are thus formed between the chamber D and the mixing chamber E for the passage of air. Upon the upper end of the mixing chamber E rests a ring E² of L-shape cross-section. To the ring E² is secured, as by means of screws E³, a circular piece of wire gauze E⁴, preferably domed, and having holes through which the upper sections of the pipes C pass.

The top D¹ of the lower chamber D is screwed into the chamber D and has in the center a small orifice D² through which the gas issues into the mixing chamber E. Above the chamber D is a baffle plate F slightly domed or bulged and having a number of perforations, larger toward its periphery. There are no perforations, however, at the center of the baffle plate. In order to maintain the baffle plate in the desired position, sleeves C² are provided which surround the pipes C and rest on the top D¹ of the chamber D. The baffle plate is supported by the sleeves C² and is prevented from moving up along the pipes C by means of a bowed piece of spring steel G. The spring G is recessed at its ends to engage the pipes C and is held in position by reason of the force it exerts outward between the two pipes C.

The mixing chamber E rests on a flange H¹ extending inwardly from a vertical extension or ring H² on a base H. The ring H² is connected with the base H by a number of webs H³. To the underside of the base H a baffle plate I is secured, as by means of screws I¹ screwed into the webs H³.

A valve for regulating the quantity of air passing to the mixing chamber E is arranged at the lower end of the chamber. The valve shown in Fig. 1 consists of a segmental disk valve J capable of being turned to cover or uncover openings J¹ in the plate J² secured, by means of projections J³, to the webs H³. The disk valve J is secured to a central screw J⁴ passing through the plate J² and provided at its lower end with a handle J⁵ by which the position of the valve may be adjusted.

Lugs H⁴ project upward from the base H and a circular casing K fits around these lugs and is secured thereto by means of screws K¹. The casing K is perforated near its upper and lower ends as shown. At the

upper end of the casing K is secured a perforated top or grid K². A number of projections K³, or a ledge, is secured near the upper end of the casing K and, if desired, a
 5 perforated disk L of refractory material, such as a mixture of fire-clay and asbestos, may be fitted in the stove between the chamber B and the grid K², being supported by the projections K³.

10 The stove shown in Fig. 1 is provided with a removable cover or cap M which rests on the grid K² and is held in position by a depending flange M¹. The upper surface of the cap M is perforated in any design, it is shown in the figure in the form of a grid.
 15 A lifting ring M² is provided in the top M. The ring may be loose as shown or a fixed ring or knob may be employed.

The perforated ring N shown in Fig. 2 consists of fire-clay, metal, or any other highly refractory substance, and such a ring may be used, if desired, with the burner to give out more heat. The ring N would be placed between the chamber B and the ring
 20 E², resting on the latter.

The gas supply pipe A is fitted with a regulator O which may be adjusted so as to allow the right amount of gas to pass to the burner, that is, the quantity of gas which
 25 will give the best result with the particular burner to which it is fitted.

The regulator O may be fixed in the gas supply pipe out of ordinary reach so as not to be interfered with when once adjusted
 30 and the supply of gas to the burner may be turned on or shut off by means of an ordinary gas cock P.

The burner operates as follows:—The regulated supply of gas, according to the capacity of the burner, is admitted to the
 40 pipe A. The gas fills the chamber B and passes down the pipes C into the lower chamber D. The gas issues through the orifice D³ and, impinging on the baffle plate F, becomes broken up and passes into the mixing chamber E where it becomes mixed with the air admitted at the bottom of the mixing chamber and passing by the chamber D. The mixture of gas and air leaves
 45 the mixing chamber E through the wire gauze E⁴ and is ignited so as to burn with a very light blue flame which plays on the under side of the chamber B. After a short time, as the chamber B is made of thin
 50 metal, it will become heated, reaching a temperature of from 1200–1800°. The gas in the chamber B will therefore also be heated to a high temperature and, by passing down into the chamber D, which it does
 55 by way of the tubes C, it will transfer some of its heat to the chamber D. The air supplied to the mixing chamber will pass outside the heated chamber D and will thereby also become heated before it mixes with the
 60 heated gas issuing from the orifice D³. The

result of this arrangement is that better combustion is set up at the top of the mixing chamber and no spontaneous combustion takes place in the mixing chamber itself.

The gas supplied may be arranged to enter the chamber B at the bottom instead of at the top. Where it is desired to use the burner for lighting purposes, an incandescent mantle may be arranged in the known
 70 manner over the flame and surrounding the chamber B.

The bottom baffle plate I may, if desired, be corrugated so as to provide openings around its periphery where it engages the
 75 base H to admit air to the mixing chamber. The baffle plate I prevents back lighting due to floor drafts.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In a regenerative gas burner, the combination of a chamber arranged to be heated by the flame of the burning gas and through which the gas supply passes, a second chamber from which the heated gas issues, pipes
 80 connecting the first chamber with the second chamber, and a mixing chamber surrounding the second chamber, and said pipes, and extending toward the first chamber, substantially as described.

2. In a regenerative gas burner, the combination of a chamber arranged over the point of ignition, a gas supply pipe for the chamber, a second chamber from which the heated gas issues, pipes connecting the first
 90 chamber with the second chamber, a mixing chamber surrounding the second chamber and said pipes, and extending toward the first chamber, means for admitting air at the lower end of the mixing chamber so as
 95 to pass said second chamber, and a baffle-plate arranged above the said second chamber for causing the mixing of the air with the heated gas issuing therefrom, substantially as described.

3. In a regenerative gas burner, the combination of a chamber, means for supplying gas to the chamber, a second chamber in communication with the first chamber and provided with an orifice for the escape of
 100 the gas, a mixing chamber surrounding the second chamber and arranged to convey air and the gas escaping from the orifice of the second chamber for ignition to heat the first chamber, means for regulating the admission of the air to the mixing chamber, and a baffle plate arranged in the mixing chamber opposite the orifice of the second chamber for causing the mixing of the air and the heated gas, substantially as described.

4. In a regenerative gas burner, the combination of a chamber, means for supplying gas to the chamber, a second chamber in communication with the first chamber and provided with an orifice for the escape of
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the gas, a mixing chamber surrounding the second chamber and having one end covered by wire gauze and carrying a perforated ring in proximity to the first chamber, and a baffle plate arranged in the mixing chamber opposite the orifice of the second chamber, substantially as described.

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5. In a regenerative gas burner, the combination of a chamber, means for supplying gas to the chamber, a second chamber, conduits connecting the first chamber with the second chamber, the second chamber having an orifice for the escape of the gas, a mixing chamber surrounding the second chamber and having an end covered by wire gauze and carrying a perforated ring in

proximity to the first chamber, a plate at the other end of the mixing chamber provided with openings for admitting air, a disk valve for regulating the size of the openings in said plate, and a baffle plate arranged within the mixing chamber opposite the orifice of the second chamber and provided with perforations near its periphery, substantially as described. 20

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In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANZ BLUMENSTEIN.

Witnesses:

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